Amendments to the claims:

1. (Currently amended) A mask assembly comprising:

a body having an internal surface, an external surface, and a perimeter surface; and

a forehead support connected to the body, the forehead support having an EEG sensor located thereon,

a processor adapted to receive a signal from said EEG sensor, said processor determining said patient's sleep stage based at least in part on said signal; and

a gas delivery device in communication with said breathing mask, said gas delivery device delivering gas to the patient based on a processor determination of said patient's sleep stage.

2. (Original) The assembly of claim 1, wherein the perimeter surface includes a padding material having a thermosensitive coating.

3. (Previously presented) The assembly of claim 1 wherein the forehead support includes a forehead support bar extending in a generally lateral direction from the forehead support.

4. (Original) The assembly of claim 3, and wherein an SPO2 sensor is located on the forehead support bar.

5. (Original) The assembly of claim 4, wherein the EEG sensor includes a pad comprised of a conductive carbonized rubber material.

6. (Original) The assembly of claim 1, and further comprising a strap extending from the mask, and wherein a physiological sensor is located on the strap.

7. (Previously presented) The assembly of claim 5, wherein a portion of the conductive material is adapted to measure EOG.

8. (Currently amended) A gas delivery system comprising:

a mask having ~~at least one physiological~~ an EEG sensor connected thereto;

a gas delivery device having an adjustable gas delivery setting; and

a processor in communication with the gas delivery device and the EEG sensor, the processor adapted to determine ~~the existence of~~ a sleep ~~disorder~~ stage of a patient and to adjust ~~the~~ a gas delivery setting based ~~thereon~~ upon a determined sleep stage.

9. (Currently amended) The system of claim 8~~, wherein the sensor is~~ further comprising an EMG sensor.

10. (Currently amended) The system of claim 8~~, wherein the sensor is~~ further comprising an ECG sensor.

11. (Original) The system of claim 10, and further comprising a SPO2 sensor connected to the mask.

12. (Canceled)

13. (Canceled)

14. (Currently amended) A gas delivery system comprising:

a mask having at least one EEG sensor connected thereto;

a gas delivery device having an adjustable gas delivery setting; and

a processor in communication with the gas delivery device and the EEG sensor, the processor adapted to determine ~~arousal~~ a patient's sleep stage and to adjust the gas delivery setting based thereon.

15. (Currently amended) The system of claim 14, wherein an SPO2 sensor and an ECG sensor are connected to the mask, and wherein the processor is in communication with both sensors and is adapted to derive a ~~PTT~~ pulse transit time value from an output of each sensor.

16. (Currently amended) The system of claim 14, and further comprising a strap extending from the mask and a plurality of EMG sensors located on the mask and strap, the EMG sensors positioned to detect muscle activity related to sleep ~~state~~ stage.

17. (Currently amended) A method of delivering gas comprising:

providing a mask adapted to detect ~~physiological signals~~ an EEG signal and to deliver a gas;

providing a gas delivery device in fluid communication with the mask and having an adjustable gas output;

determining a sleep ~~state~~ stage from ~~physiological~~ EEG signals detected by the mask; and

adjusting the output from the gas delivery device based on the sleep ~~state~~ stage.

18. (Currently amended) The method of claim 17, wherein determining a sleep ~~state~~ stage includes determining arousal.

19. (Currently amended) The method of claim 18, wherein determining arousal includes calculating ~~PTT~~ pulse transit time values from an SPO2 and ECG readings.

20. (Original) The method of claim 18, wherein determining arousal includes analyzing cortical and subcortical EEG signals.

21. (Currently amended) The [[A]] method of ~~obtaining SPO2 reading from a mask~~ claim 18 further comprising:

attaching a light source and a light sensor on ~~a~~ the mask so that the light source and light sensor are positioned to contact a ~~person's~~ forehead of a patient;

illuminating the light source;

detecting light from the light source as it deflects from the ~~person's~~ patient's skull; and

converting the detected light into an analog signal.

22. (Original) The method of claim 21, and further comprising the additional step of high pass filtering the analog signal.

23. (Currently amended) ~~A method of detecting oral or nasal breathing during nasal ventilation, the method~~ The method of claim 18 further comprising:

~~providing a mask adapted to form a seal between a patient's nose and mouth,~~ with the mask having an interior surface and an exterior surface, the mask also having a first thermal sensor on the interior surface and a second thermal sensor located on the exterior surface to be adjacent the patient's mouth; detecting a temperature change in the first or second thermal sensor.

24. (Currently amended) ~~An apparatus~~ The system of claim 14 further comprising:

~~a mask having~~ a body position sensor attached ~~thereto~~ to the mask, and ~~;a~~ the processor in communication with the body position sensor and adapted to a determine body position from the body position sensor's output.

25. (Currently amended) The ~~apparatus~~ system of claim ~~23~~24, and further comprising movement sensor attached to the mask and in communication with the processor, and wherein the processor is also adapted to determine movement from an output of the movement sensor.

26. (Currently amended) The [[A]] method ~~of detecting a leak in a breathing mask:~~ of claim 17 further comprising:

providing ~~a mask having~~ a perimeter surface of the mask with a plurality of thermally conductive surfaces distributed throughout the perimeter surface; and

detecting a temperature change in any of the plurality of thermally conductive surfaces.

27. (Currently amended) The [[A]] ~~mask assembly~~ gas delivery system of claim 14 further comprising:

a mask body having an internal surface, an external surface, and a perimeter surface; and

a forehead support extending from the body and adapted to contact a forehead surface of

a ~~the~~ patient during use, the forehead support having a plurality of sensors located thereon for detecting electrophysiological signals of the patient.

28. (Currently amended) The ~~mask assembly~~ gas delivery system of claim ~~26~~27 wherein the forehead support includes a support pad in contact with the forehead surface.

29. (Currently amended) The ~~mask assembly~~ gas delivery system of claim ~~26~~27 further comprising:

       a movement sensor for detecting movement of the patient during use.

30. (Currently amended) The ~~mask assembly~~ gas delivery system of claim ~~26~~27 further comprising:

       a mask seal leakage detector.

31. (Canceled)

32. (Canceled)